RECONSTRUCTED MOA, a large, flightless bird of New Zealand, is from Heuvelmans.

Reviews

CREATURES EXTINCT, LIVING OR FICTIONAL

Reviewed by
GEORGE GAYLORD SIMPSON

ON THE TRACK OF UNKNOWN ANIMALS, by Bernard Heuvelmans. *Hill and Wang, $7.50; 558 pp., illus.*

EVERY YEAR several thousand kinds of animals are described and named for the first time. It is variously estimated that perhaps a third or perhaps a half of the kinds of animals actually existing are still unknown, in the sense that they have not yet been defined and given scientific names by zoologists. These facts are striking enough, and they emphasize how much work must still be done before we can say that we really know the fauna of our planet.

There are, nevertheless, indications that our ignorance is not quite so extensive as these over-all figures might indicate. To begin with, the vast majority of new animals now being described and still to be made known are insects. Although they are small and often obscure, it is usually no great problem to find new kinds. This is mainly because there are so many insects compared with the small number of entomologists that there simply has not been time to describe them all. Among the less varied groups of animals, such as the birds and mammals, on the other hand, the rate of discovery has slowed down greatly and is approaching zero. There is unmistakable evidence that we really do already know almost (but not quite) all of these more obvious and, on the whole, more interesting animals.

Another point is that most of the "new" animals now being described are not particularly novel—they are so closely related to forms already known that to the nonspecialist they seem almost identical. Now many of them—among birds and mammals, a large majority—are subspecies; and a subspecies is usually an arbitrary or subjective unit. Within broad limits, you can distinguish almost as many of them as you like, and some zoologists do amuse (or aggrandize) themselves in that way. The basic, reasonably nonarbitrary or objective unit in nature is the species. Among birds and mammals, again, and among some other groups, the number of "known" species has actually *decreased* markedly in recent years. This is not because many species have recently become extinct (although a few have), but because many groups earlier described as species are now found either to be subspecies or to have no natural validity.

ON these and, unfortunately, on a number of other points, Heuvelmans' enthusiastic and interesting book is misleading. It is certainly legitimate for the writer of a popular book to single out the unusual and the romantic. Heuvelmans has done this skillfully, and in this respect his book is valuable and fascinating. It is not, however, logical to argue that because the unusual sometimes happens it is to be expected. It is downright disingenuous to evaluate all kinds of suspect evidence on that basis and to insist that the improbable is probable or certain merely because it is not impossible.

Right at the start, Heuvelmans sets up a straw man that he attacks throughout the book with all the fervor of a Quixote tilting at windmills. He says that the "official attitude" of zoologists is that the world has been completely explored, that no new animals have been discovered for a long time, and that animals known only as fossils will not be found alive. He has no trouble demolishing those three propositions, but his evidence—as far as it is correct—is entirely derived from the work of the zoologists themselves. Heuvelmans seems to think that the official attitude of zoologists is that zoologists are not acquainted with their own work! He is particularly bitter against the paleontologist Baron Cuvier, who died in 1832 and is not exactly the

official spokesman for modern zoology.

Actually, zoologists are so well aware of the inadequacy of earlier *zoological* exploration that they expect any large collection, even from a region geographically well known, to contain some hitherto undescribed animals. They know that new animals are discovered every day because in 999 cases out of 1,000 they are the ones who discover them. They know that groups previously known only as fossils do sometimes (really very rarely) turn up alive, because without exception it is the zoologists who have demonstrated that fact.

Heuvelmans' intemperate attack on the zoologists, emphasized by still more vituperous introductory remarks by Gerald Durrell, is, in one word, silly. It can hardly be overlooked, because it permeates the book, but it can be discounted, and one can go on to enjoy Heuvelmans' often excellent accounts of some of the more remarkable of the zoologists' discoveries.

As noted at the outset, the many new animals being discovered nowadays are rarely very novel, but there are exceptions. It is, of course, on these exceptions that the romanticist centers attention—and quite properly. There are all levels of novelty. The largest of all living apes was not discovered until 1901, but most zoologists consider it merely a somewhat larger mountain *subspecies* of the long-familiar common gorilla. Grévy's zebra, first definitely identified in 1882 (not exactly yesterday), was a strikingly novel *species*, but it belonged to a genus known since antiquity. The pygmy hippopotamus, now considered a distinct *genus* although manifestly related to the common hippopotamus, was discovered in 1843. It is significant that the dates for increasingly novel discoveries tend to recede in time—although there are exceptions such as the okapi, to be mentioned below. The last really new family of living mammals to be discovered, and perhaps the last ever, was not named until 1939, but it is based on small burrowing rodents at which no one but a zoologist would look twice. (Heuvelmans does not mention them.) Far more striking novelties have, indeed, been discovered still more recently, but they are invertebrates, mostly quite obscure aquatic forms and so outside Heuvelman's inquiry, which is confined to terrestrial vertebrates.

The second major theme of romantic zoology is that of the so-called "living fossils," and Heuvelmans flounders obscurely in his attempts to define this loose popular term. His most stringent definition, to which he does not himself adhere at all closely, is "an ancient type of organism which has survived until today without undergoing any great anatomical change." But man, as far as any creature from the usual concept of a living fossil, has not undergone any great anatomical change since perhaps 100,000 B.C., which seems fairly ancient to most of us. Everything is a living fossil by that standard. There are, of course, less equivocal examples such as the New Zealand tuatara, which has not undergone any great anatomical change since the Jurassic period, perhaps 150 million years ago. (It is fairly typical that Heuvelmans increases the reliably established figure by about a half, assigning the tuatara to the Permian on no known evidence.)

It should be emphasized that the case of the tuatara is exceptional to the point of being unique. Of the many thousands of Jurassic and earlier terrestrial vertebrates it is the *only one* that has survived with little change. Heuvelmans says that the turtles and crocodiles have "hardly changed" since the beginning of the Triassic, but he is wrong both as to their known age and the amount of change.

Another category of "living fossils" includes animals, not necessarily primitive or unchanging, that were believed to be extinct but were later found to be living. Although the examples are few, they are striking, and they cover a broad spectrum. The takahe and moho, flightless rails of New Zealand, were first known from bones in 1847 and one was found alive in 1849. Others turned up periodically until 1898, but thereafter it was believed that they might be extinct. However, a small group of takahes was found alive in an exceptionally remote spot in 1947, and they are probably still living there. Although fascinating, this is not particularly surprising. Near the other extreme is the now famous *Latimeria*, found in 1938, a living representative of a group of marine fishes (coelacanths) well-known as fossils but only up to the late Cretaceous, perhaps seventy-five million years ago.

ABOMINABLE SNOWMAN was reconstructed on basis of evidence from many sources.

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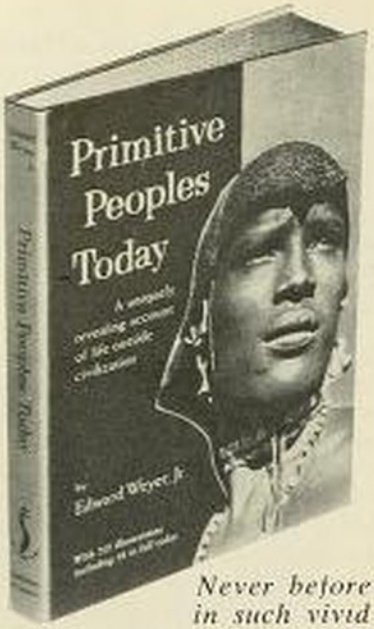

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There are still more remarkable resurrections of one or two invertebrate groups, but the record for terrestrial vertebrates is nowhere near as great. The okapi, first definitely recognized in 1901 although equivocally known earlier, belongs to a subfamily previously known only from fossils, of which the youngest were on the order of five million years old. Of all true discoveries of large, new mammals in modern times, this is perhaps the most romantic, but even so it can be over-romanticized. The okapi is not just like any of its known extinct forerunners, belonging to a quite different genus, and it has a fairly close living relative of the same family, the giraffe, which was familiar to civilized men long before the Christian era.

On this basis, Heuvelmans argues as follows (not so succinctly, but quite along these lines): We know that some living animals belong to groups that have not changed greatly in millions of years. We know also that some groups believed to be extinct for millions of years have proved to have living representatives. Therefore, it is likely that almost any "extinct" group, such as that of the dinosaurs, will turn up little changed in the modern fauna. That is generalizing from the plainly exceptional case, and that is where the scientist, although equally fascinated by the romance of his subject, parts company with the nonscientific romanticizer. It is a matter of judging probabilities. A negative cannot be proved in the full sense of the word. There is *some* probability that there are little men on the far side of the moon, but the probability is infinitesimally small. For numerous reasons that can hardly be discussed here, the probability that there are living dinosaurs is only a little larger.

THAT brings up another category of "unknowns," to which much of Heuvelmans' book is devoted: the many strange animals that have been persistently rumored or purportedly sighted without any specimens ever being submitted to scientific examination. To the pure romantic, most or all of them are real and are, indeed, novel unknowns. Heuvelmans, a fair example of both the virtues and the faults of that school, generally reaches such a conclusion as "certain." To the scientific zoologist the conclusion is certain (100 per cent probability) only when a genuine specimen is available for all to examine. Otherwise the probability ranges down toward, although never quite to, zero, depending on dispassionate, hard-headed evaluation of the actual evidence.

Let us discuss just one of the examples that Heuvelmans considers certain and that I consider extremely improbable. Under the title "Apes in Green Hell" Heuvelmans devotes a whole chapter to

Now Alexander Agassiz Professor of Zoology at Harvard, DR. SIMPSON is well known for his numerous books.

the supposed anthropoid ape of South America, and his frontispiece purports to show it, "...the only 'unknown' animal of which there is a good photograph."

The chapter starts with four pages of old tales, which range from the fictional (a passage from Voltaire's *Candide*) to the legendary. No one could possibly take them seriously, and indeed Heuvelmans makes no great point of them. The discovery for which he does claim complete credence was supposedly made by the Swiss zoologist François de Loys in 1920, near the border of Colombia and Venezuela. According to Loys's story, he killed one of two animals seen, propped up the dead body, and photographed it. Loys stated that the beast was larger than any known South American monkey and that it lacked a tail, which all known South American monkeys do have. On the basis of the photograph and these statements, Professor Georges Montandon "identified" the animal as a new member of the anthropoid apes (all of which are otherwise confined to southern Asia and Africa) and gave it the name *Ameranthropoides loysi*.

NOW everyone, including Heuvelmans, who has examined the photograph with even meager competence agrees that it looks like a well-known and common South American spider monkey. Heuvelmans does suggest a few minor differences, but these supposed distinctions either are not really visible in the photograph or are known as variants among spider monkeys. The only reasons for thinking the animal in the photograph is not a spider monkey are that it is supposedly larger and tailless—factors both of which depend on Loys's unsupported word. Neither can be established from the photograph itself, and is not this an odd circumstance? Loys knew that he had made (or would claim to have made) a remarkable discovery of a large, tailless animal, but he did not bother to establish either peculiarity in a photograph, as could easily have been done at the time.

At different times, Loys said the animal was 4'5" and 5'1¾" in height. The difference between these two "measurements" is about the same as between the smaller of them and the stature of some known spider monkeys. Moreover, Loys did not bring back a scrap of the animal, not a piece of hide, a tooth, or a single bone. On this, Heuvelmans' only comment is that the expedition cook turned the skull "into a salt box," which disintegrated. Where was Loys when the concrete evidence of the discovery of a lifetime was so oddly destroyed?

Heuvelmans has bolstered this ex-

(Continued on page 544)

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REVIEWS *(Continued from page 494)*

tremely unconvincing tale with a few later claims, some even less convincing and some hardly pertinent. The Marquis de Wavrin (on other evidence an honest but credulous traveler) passed on a hearsay report of a large *tailed* monkey, which he had not seen but had heard. (In the jungle you can hear anything you fancy, or what you hear can be anything you want.) Obviously, this unseen tailed monkey was not "*Ameranthropoides*," but Heuvelmans gratuitously suggests that someone confused a spider monkey with the ape, which therefore exists! Then one Roger Courteville claimed to have met and fought one of Loys's great apes. Although he gives Courteville's account at length, even Heuvelmans admits that it was a fake inspired by Loys's story. Several other supposed sightings at points hundreds or thousands of miles apart are adduced as further evidence by Heuvelmans, but all were given at second- or third-hand some twenty or thirty years after the claimed events.

The Sierra de Perijá, where Loys photographed his animal, is still a difficult region, but it has been explored by many collectors and scientists in the almost forty years since Loys was there. Except for the obvious faker Courteville, no one has reported seeing an unusually large or tailless monkey there or hearing any rumor of one.

In short, the only objective evidence is a photograph indistinguishable from that of a well-known spider monkey. All the other evidence is either manifestly unreliable hearsay or open to strong suspicion, at least. Yet Heuvelmans' conclusion is that the existence of a South American great ape cannot be disputed "except by the disingenuous or the blind." I need not belabor the point.

I DO NOT mean to say that all of Heuvelmans' conclusions are on such an absurd level or that he is completely credulous. He does dismiss a fake still more obvious than Courteville's and even remarks that the perpetrator, a former racing driver, "has no scientific standing." He also remarks that a migration route for the animal, a supposed dinosaur in New Guinea, never existed; but in the next chapter, he thinks it quite likely that dinosaurs do survive in Australia, which would require just such a migration route. At one point, he even implies that an expedition's reporting *not* finding a rumored animal suggests that it does exist. He suspects that the party wanted to discourage others until they could capture the fabulous beast.

On the other hand, one must agree that the reports on the "abominable snowman," to which Heuvelmans naturally devotes much space, seem to have

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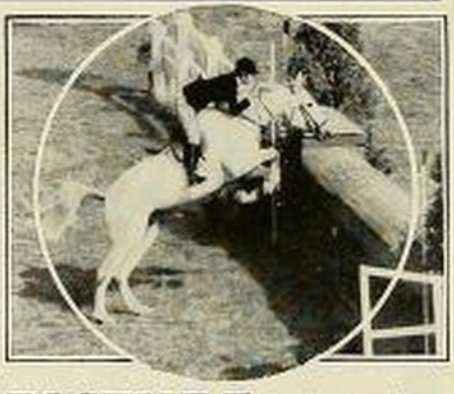

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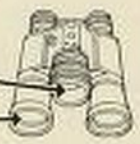

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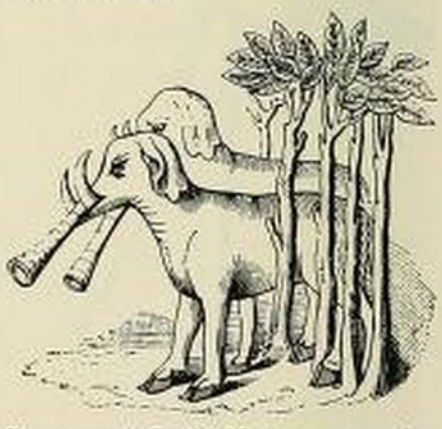
a hard core of fact within the mass of contradictory and sometimes ridiculous accounts. Heuvelmans' conclusion that it is a surviving *Gigantopithecus* (an ape known from fossils in the Pleistocene of China) is premature, to say the least, but there probably is some animal that makes "yeti" tracks. It may be something new or something already known. Such specimens of the fabulous nandi bear of eastern Africa as have reached zoologists turned out to be ratels, rather uncommon animals that have nevertheless been known to zoologists since the eighteenth century. Heuvelmans still maintains that the nandi bears that were not collected were something else, and this brings up another pertinent point. When zoologists have investigated the regions where strange animals have been persistently reported, they have either found the animals forthwith or have, until now, never found them. There is some probability that they do quickly find the real ones. Perhaps the "abominable snowman" will be the exception.

By sheer force of numbers, Heuvelmans and the other romantics may well have predicted some discovery that will actually be made; if you buy most of the tickets in a lottery, you are likely to win on one. Their judgment of probabilities is certainly too sanguine, their interpretations of evidence vastly too charitable, and their whole attitude more enthusiastic than judicious. Nevertheless, they are highly entertaining, and no harm is done if they are not taken too seriously. The romance is delightful even when the science is shaky.

IN BRIEF



ELEPHANTS in British Museum manuscript.

ELEPHANTS, by Richard Carrington. *Basic Books, $5.00; 272 pp., illus.*

THIS interesting but needlessly spotty discussion is divided into three parts. "Elephants as Animals," the first section, concerns the anatomy and natural history of these creatures; it contains a great deal of information but is marred by the excessively anthropomorphic way in which this information is presented. The second part, "Elephants as Fossils," is excellent. The elephants